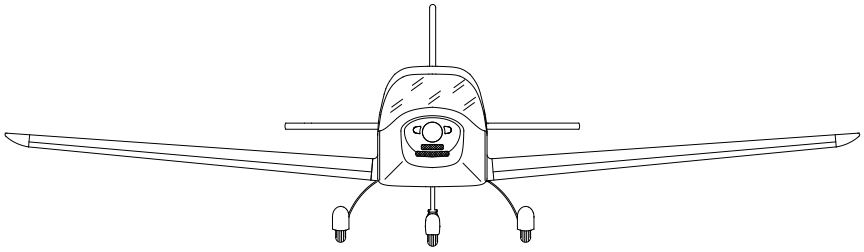
COSTRUZIONI AERONAUTICHE
TECNAM



P2002 Aircraft

Report n° 2002/60A

Spinning flight test report

1st Edition 29th November 2004; Revision 0

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REV.	DATE	SIGNATURE

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1 RESULTS OF SPINNING TESTS

INTRODUCTION

On February 27, 2004, spinning tests were conducted at the Castelvolturno airfield with the P2002-JF marks I-TEJF.

1.1 Purpose of the test.

The tests were conducted to meet the requirements of CS-VLA regulation 221(a).

1.2 References.

a) CS-VLA 221 “Spinning”

b) AC23-8 par. 100

c) Flight Testing of Fixed-Wing Aircraft (Ralph D.Kimberlin);

d) Tables showing aeroplane weight and centre of gravity (attached)

e) Data from the onboard data acquisition system

f) Flight log

1.3 Test conditions.

Tests were conducted with the following two different aircraft configurations:

1. TEST WITH AFT C.G. **(30.07)**

Spin Number	Flap UP	Flap LAND	RH SPIN TURN	LH SPIN TURN
1	X		X	
2	X			X
3		X	X	
4		X		X

1. TEST WITH FORWARD C.G. **(26.44)**

Spin Number	Flap UP	Flap LAND	RH SPIN TURN	LH SPIN TURN
1	X		X	
2	X			X
3		X	X	
4		X		X

1.4 Test procedure.

Each spin was performed as follows:

i) The aeroplane was trimmed at a speed of 72 Kts (speed range below 1.3 V_{S1}); with the CG in the aft and forward position and with the engine throttle set to idle at an altitude of 3000 ft;

ii) speed was reduced using the longitudinal control at a maximum speed reduction rate of 1 Kts/sec, until the aeroplane stalled;

iii) once the aeroplane had stalled, with the ailerons in neutral position, "full elevator" to nose over and "full rudder" in the direction of the spin were applied at the same time;

iv) the aeroplane was "recovered" using the longitudinal control and the directional control without power;

v) the aeroplane's behaviour as it came out of the spin was recorded.

	*The spinning test development has been recorded with a camera on the Castelvolturno airfield and the evolution of the test is shown below by photos shot every second.*
	*After first second*

	*2rd second*
	*After three seconds the airplane completed one whole spin*

1.5 Data acquisition.

The following parameters were recorded in the tests:

i) Flight altitude

ii) Flight speed

iii) Engine RPM

iv) Flap rotation

v) Elevator rotation

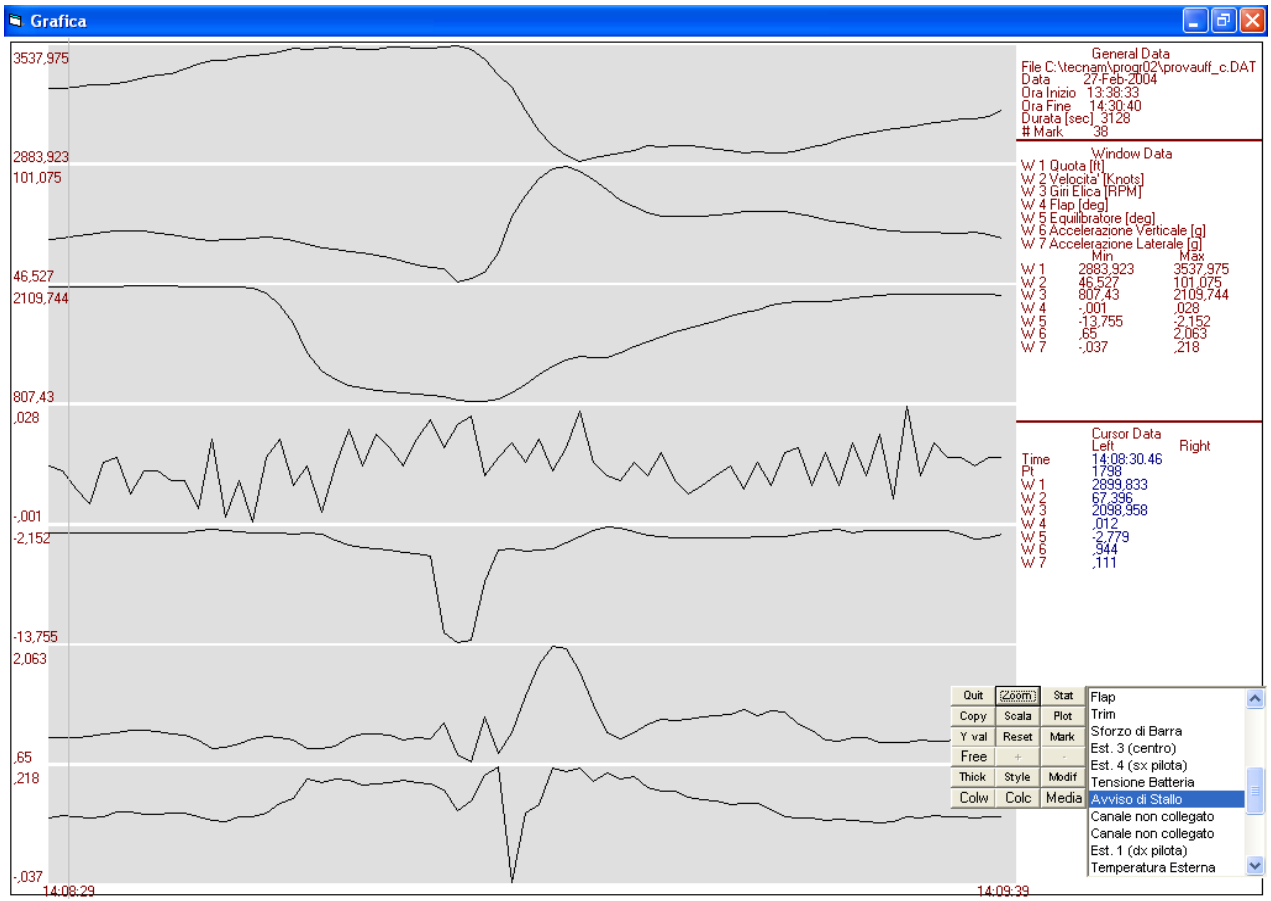
vi) Normal acceleration

vii) Lateral acceleration

1.6 Results.

During the tests the aeroplane demonstrated an excellent ability to spin; in 3" the aeroplane did complete one whole spin; it came out of the spin almost spontaneously as soon as the controls were touched.

One file was acquired on February 27 (provauffc.dat) and the time history and test record are provided below. In this file it's possible distinguish the airplane trimmed at 72 kts at altitude 3000feet; the airplane reduced the velocity until reaching a speed of 46,5 knots with the elevator at max extension of –13° and the max acceleration values were 2,063g for normal acceleration and 0,037g for lateral acceleration.



FLIGHT LOG

February 27, 2004

Location: Castelvolturno (CE)

Airfield: “Ranch” 41° 5’ 0” Nord 13° 58’ 0” East

FLIGHT n°1

DEPARTURE	ARRIVAL	DURATION	PILOT	COPILOT
13.19	14.05	46 min	Com. Pozzoli	Com.De Stefano

FLIGHT n°2

DEPARTURE	ARRIVAL	DURATION	PILOT	COPILOT
14.40	15.23	43 min	Com. De Blasio	X

FLIGHT TEST

WEIGHT AND CENTRE OF GRAVITY

P2002-JF Marks I-TEJF s/n 001

DATUM: Propeller flange (1,337m)

LOAD CONDITION				
	Weight (kg)	Arm (m)	Momentum (kg x m)	% CMA
EMPTY (official weighing on 07/05/03)	368,3	1,706	628,3	26,9
Data acquisition equipment	already included			
Pilot	80	1.83	146	
Copilot	87	1.83	159	
Fuel	36	1.53	55	
Rear ballast	3	5.6	34	
Front ballast	0	0.35	0.0	
Take-off weight	577,3		1023	31,7

DATA: 27 02 04 **FLIGHT n°1**

NOTE: Spin
PILOT : Com. Pozzoli
CREW : Com. De Stefano

COSTRUZIONI AERONAUTICHE TECNAM **FLIGHT TEST** DATE 27/02/'04

SPINNING TESTS

✈ **P2002-JF I-TEJF s/n 001** **TEST N° 1**

JAR VLA - 221;

Fuel SX: 24 lt Fuel DX: 24 lt

Weight: 577,3 Kg CG: 31,7 %

- *ALTITUDE:* ***3000FT;***
- *FLAPS:* **UP & LAND;**
- *TRIMMED SPEED:* ***72KIAS;***
- *REDUCE THE SPEED UNTIL TO STALL WITH A DECELERATION OF 1KNOT/SEC;*
- *WITH THE AILERONS IN NEUTRAL POSITION, FULL STABILATOR TO NOSE UP AND FULL RUDDER IN DIRECTION TO SPINNING ROTATION (RH AND LH);*
- *RECOVER TO SPIN USING THE LONGITUDINAL CONTROL AND THE DIRECTIONAL CONTROL;*

VERIFY THAT IS POSSIBLE TO RECOVER THE AIRCRAFT FROM A ONE-TURN SPIN OR A 3-SECOND SPIN, WHICHEVER TAKES LONGER, IN NOT MORE THAN ONE ADDITIONAL TURN, WITH THE CONTROLS USED IN THE MANNER NORMALLY USED FOR RECOVERY.
IN ADDITION, THE APPLICABLE AIRSPEED LIMIT AND POSITIVE LIMIT MANEUVERING LOAD FACTOR MAY NOT BE EXCEEDED. VERIFY NO EXCESSIVE BACK PRESSURE DURING THE SPIN OR RECOVERY AND THAT IS IMPOSSIBLE TO OBTAIN UNCONTROLLABLE SPINS WITH ANY USE OF THE CONTROLS.

RESULTS: POSITIVE ☑ NEGATIVE ☐

ACQUISITION

☒ Speed	☒ Alt	☐ OAT	☒ RPM	☐ TT1	☐ TT2
☐ T. Oil	☐ GPS	☐ Ailer.	☒ Flap	☒ Stabil.	☐ Trim
☐ Stall War	☐ Rudder	☒ VERT. Accel.	☐ Load	☒ LATERAL ACCEL	☐

TEST PILOT: [redacted]

FLIGHT TEST

WEIGHT AND CENTRE OF GRAVITY

P2002-JF Marks I-TEJF s/n 001

DATUM: Propeller flange (1,337m)

LOAD CONDITION				
	Weight (kg)	Arm (m)	Momentum (kg x m)	% CMA
EMPTY (07/05/03)	368,3	1,706	628,3	26,9
Data acquisition equipment	already included			
Pilot	100	1.83	183	
Crew	0	1.83	0	
Fuel	72	1.53	110	
Rear ballast	0	5.6	0	
Front ballast	12	0.35	4	
Take-off weight	552,3		926	24,7

DATA: 27 02 04 **FLIGHT n°2**

Note: Spin
Pilot : Com. De Blasio

COSTRUZIONI AERONAUTICHE TECNAM **FLIGHT TEST** DATE 27/02/'04

SPINNING TESTS

✈ **P2002-JF I-TEJF s/n 001** **TEST N° 2**

JAR VLA - 221;

Fuel SX: 48 lt Fuel DX: 48 lt

Weight: 552,3 Kg CG: 24,7 %

- *ALTITUDE:* ***3000FT;***
- *FLAPS:* **UP & LAND;**
- *TRIMMED SPEED:* ***72KIAS;***
- *REDUCE THE SPEED UNTIL TO STALL WITH A DECELERATION OF 1KNOT/SEC;*
- *WITH THE AILERONS IN NEUTRAL POSITION, FULL STABILATOR TO NOSE UP AND FULL RUDDER IN DIRECTION TO SPINNING ROTATION (RH AND LH);*
- *RECOVER TO SPIN USING THE LONGITUDINAL CONTROL AND THE DIRECTIONAL CONTROL;*

VERIFY THAT IS POSSIBLE TO RECOVER THE AIRCRAFT FROM A ONE-TURN SPIN OR A 3-SECOND SPIN, WHICHEVER TAKES LONGER, IN NOT MORE THAN ONE ADDITIONAL TURN, WITH THE CONTROLS USED IN THE MANNER NORMALLY USED FOR RECOVERY.
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RESULTS: POSITIVE ☑ NEGATIVE ☐

ACQUISITION

☒ Speed	☒ Alt	☐ OAT	☒ RPM	☐ TT1	☐ TT2
☐ T. Oil	☐ GPS	☐ Ailer.	☒ Flap	☒ Stabil.	☐ Trim
☐ Stall War	☐ Rudder	☒ VERT Accel.	☐ Load	☒ LATERAL Accel.	☐

TEST PILOT: